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E6x Driver Information Systems

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Driver Information Systems

Model: E60, E61, E63 and E64

Production: All

OBJECTIVES

After completion of this module you will be able to:

- Identify the instrument cluster warning symbols

- Reset the Condition Based Service indicators

- Navigation through various screens of CID using the controller

- Explain CID screens

Instrument Cluster

The instrument clusters used in the new 5 and 6 series vehicle are similar in appearance and operation. There are slight differences which can be distinguished by the gauge configurations. The E63/E64 instrument cluster uses a speedometer which has a slightly finer scale and there is an oil temperature gauge located below the tachometer.

The E60 and future E61 uses the more familiar fuel consumption indicator in the tachometer area.

Both clusters use the new annular indicators. For the first time, this type of gauge display is used by BMW for the two main instruments . This represents an innovation in display technology. This system has enabled the displays for the cruise control system set speed and the variable engine speed warning zone to be visually illustrated.

The indicator lamp for the fuel reserve has been replaced by a Check Control message in text and graphics. Likewise, the Check Control texts are no longer displayed in the instrument cluster but in the status bar of the Central Information Display (CID).

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Two large instrument dials show vehicle speed and engine speed. The scales on the instrument cluster are specific to each country, vehicle and engine. Most of the indicator lamps are located in the center at the top between the two large instrument dials. Also in the center between the two large instrument dials are the two LC Displays.

Instrument Cluster System Overview (IPO)

K-CAN

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KOMBI

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13 — D-Bus

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PT-CAN
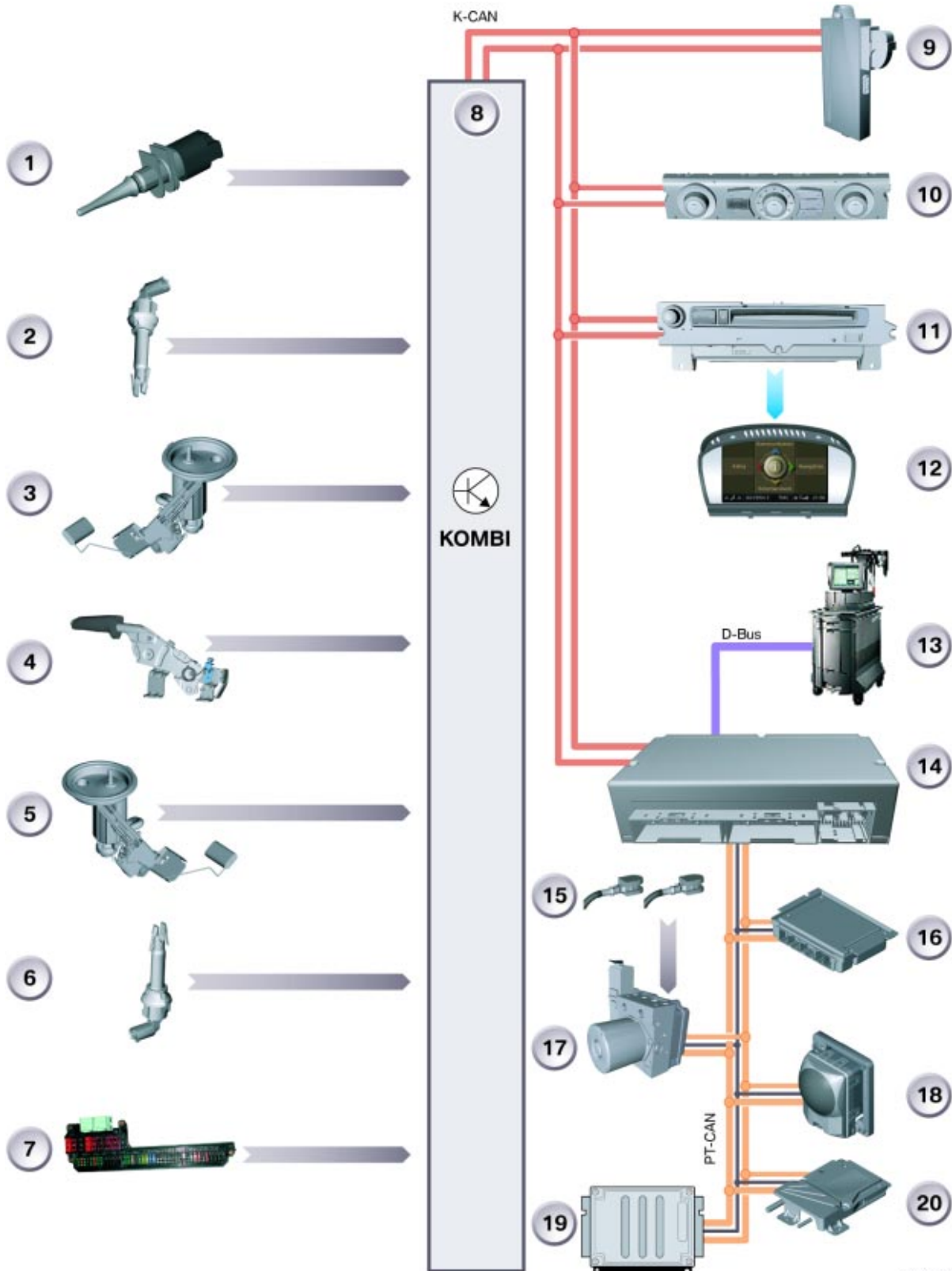
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Legend for System Overview

Index	Explanation	Index	Explanation
1	Ambient temperature sensor	11	M-ASK or CCC
2	Coolant level switch	12	Central Information Display (CD)
3	Fuel level sensor, left	13	DISplus/GT-1
4	Parking brake warning switch	14	Safety and Gateway Module (SGM)
5	Fuel level sensor, right	15	Brake pad wear sensors
6	Windshield washer fluid level sensor	16	Electronic Transmission Control Module (EGS)
7	Front power distribution box	17	Dynamic Stability Control Module (DSC)
8	Instrument cluster (kombi)	18	Active Cruise Control (ACC)
9	Car Access System (CAS)	19	Digital Motor Electronics (DME or ECM)
10	IHKA	20	Active Front Steering Module (AFS)

Cluster Inputs and Interfaces

The instrument cluster receives input signals from the following components:

Ambient Temperature Sensor

The ambient temperature sensor supplies the value for the temperature outside the vehicle to the instrument cluster. The ambient temperature is shown on the LCD display. Instrument resolution is 0.5°C (1°F). The value for ambient temperature is also made available to other control units via the K-CAN.

Note: If the ambient temperature sensor circuit fails, the display will show +50 degrees celsius if the circuit is shorted and -50 degrees celsius if the circuit is open.

Fuel Level Sensors, Left and Right

The fuel tank contains two fuel-level sensors. Each fuel-level sensor sends a signal indicating the amount of fuel in the tank. A value is obtained by adding the two signals.

Coolant Level Switch

The coolant-level switch sends a signal if the coolant level is too low (Reed contact). The information is output on the LCD display in the form of a Check-Control message.

Windshield Washer Fluid Level Switch

The Windshield washer fluid level switch sends a signal if the fluid level is too low. The information is output on the LCD display in the form of a Check-Control message.

Parking Brake Warning Switch

The parking brake warning switch indicates that the handbrake is applied. The general brake warning lamp lights up red when the handbrake is applied.

Reset Button

The reset button is used for the following functions:

- Reset trip meter

- Call up Condition Based Service (CBS)

- Call up Test functions (only for service staff)

Axial buttons in turn-signal/main-beam switch

The axial buttons (Check-Control button at top, on-board computer button at bottom) are for the following functions:

- Menu of the Check-Control system in the LCD display and clock/date selection

- Menu of the on-board computer in the LCD display

The signal generated when one of the axial buttons is pressed is transmitted through the bus system.

Bus Interfaces

The following control units communicate via the PT-CAN or the K-CAN with the control unit of the instrument cluster:

Dynamic Stability Control

An active regulation sequence or a fault in the DSC will be indicated by the corresponding indicator and warning light (ABS, DSC or DTC).

The brake pad wear sensors are also connected to the DSC control unit. The general brake warning light is actuated if the brake pads wear to the permissible limit. Front and rear brake pad wear is a CBS service operation (sensor-based).

Active Cruise Control

There are now a permanent indicator and warning lights in the instrument cluster for Active Cruise Control (ACC). They indicate: Object detected or driver override, distance levels 1 to 4.

Active Front Steering

A fault in the active front steering system is indicated by the corresponding indicator and warning light being actuated.

Digital Motor Electronics

The appropriate indicator and warning light is activated to indicate a fault in the DME.

Engine oil is a CBS service operation (sensor-based).

Electronic Transmission Control

The EGS control unit supplies the signal for the gear engaged to the instrument cluster. The selected gear is shown in the selector-lever and shift indicator in the LCD display.

Safety and Gateway Module

The appropriate indicator and warning light is activated to indicate a fault in the passive safety system (airbag).

The SGM is the gateway between the byteflight, PT-CAN and K-CAN data buses. The diagnosis lead is also connected at the SGM.

Light Module

A fault in the lighting system is indicated by the light module (LM) actuating the corresponding indicator and warning light.

Integrated automatic heating and air-conditioning system

The IHKA calculates the condition of the microfilter. The condition of the microfilter is CBS service operation.

Car Access System

The CAS control unit serves for redundant data storage. The following are stored in the CAS control unit (redundantly to the instrument cluster):

- Vehicle identification number

- Odometer reading

- CBS data

M-ASK / CCC and CID

For the instrument cluster, the M-ASK and CCC serve as an interface to the Central Information Display (CID). The CID displays detailed texts concerning Check-Control messages and information about CBS and other on-board computer functions. The CID also enables the driver to change the units of measurement (e.g. Celsius to Fahrenheit, and vice versa) for the instrument cluster.

Moreover, the M-ASK and CCC establish a telephone connection when a CBS serve operation is due (= TeleService). This is achieved by sending a message to the telephone control unit via the MOST.

Other control units communicate via the bus to send messages (Check-Control messages) to the instrument cluster. The instrument cluster emits these Check-Control messages via symbols in the LCD display.

Components

The instrument cluster comprises the following components:

- Instrument dials
- Indicator and warning lamps
- LC display
- Program and gear displays for automatic gearbox and SMG Sequential Manual Gearbox
- Setting button for resetting the trip meter and operating the Condition Based Service,CBS menu
- Connected components which serve to activate the displays in the instrument cluster

Display Areas

The instrument cluster is divided into the following display areas:

- Instrument dials (Analog Instruments)
- Indicator and warning lamps
- LC display
- Program and gear displays for automatic gearbox and SMG Sequential Manual Gearbox

Index	Explanation	Index	Explanation
1	Set speed for cruise control	4	Tachometer warning zone
2	Speedometer	5	Fuel gauge
3	Tachometer	6	Fuel consumption indicator

Analog instruments and moving-disc indicators

The instrument cluster has a total of 6 stepper motors for the various instruments. For the first time, moving-disc instruments are used in the instrument cluster.

On the left, the set speed for cruise control is displayed on a moving-disc instrument.

On the right, a moving-disc instrument shows the engine-revolutions advance-warning field.

The engine-revolutions advance-warning field is subdivided into:

- Fixed engine-revolutions advance-warning field
- Variable engine-revolutions advance-warning field

The maximum engine speed warning display is indicated by the tachometer as a function of engine temperature.

1. Start of variable warning zone
2. End of variable warning zone
3. Start of fixed warning zone
4. End of fixed warning zone

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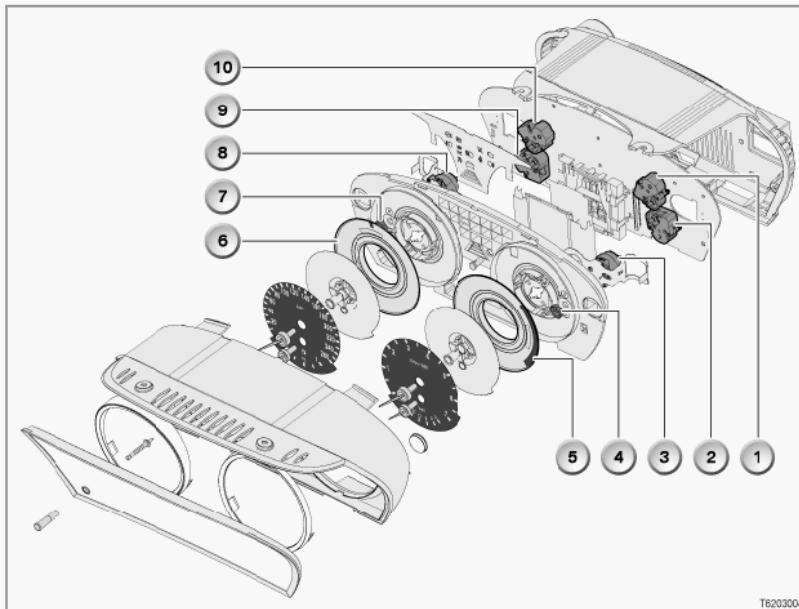
Index	Explanation	Index	Explanation
1	Stepper motor for the tachometer	6	Moving disc instrument for the cruise control speed setting
2	Stepper motor for the fuel consumption gauge (or Oil temperature gauge E63/E64)	7	Drive pinion for the moving disc instrument
3	Stepper motor for the variable RPM advance warning field	8	Stepper motor the cruise control speed setting
4	Drive pinion for the moving disc instrument	9	Stepper motor for fuel gauge reading
5	Moving disc instrument for the variable RPM advance warning field	10	Stepper motor for speedometer reading

The 6 stepper motors in the instrument cluster are used for the:

- Speedometer
- Tachometer (Revolution counter)
- Fuel gauge
- Fuel consumption indicator (E60/E61)
- Engine oil temperature (E63/E64)
- Moving-disc instrument for the speed setting of the cruise control system
- Moving-disc instrument for the variable engine-revolutions advance-warning field

The set speed for the cruise control system and the tach warning are displayed by means of annular indicators (moving rings).

The annular indicator is moved by means of the ring gear, connected to the indicator, the pinion and the stepper motor which is attached to the rear of the light duct.

U.S. vehicles will have speedometers with 0-160 MPH and 0-7000 RPM displays.

Indicators and Warning Lamps

The indicator and warning lamps are activated by the processor in the instrument cluster.

The main indicator and warning lamps are activated in the Pre-drive Check when terminal 15 is switched on. The indicator lamps and warning symbols are lit by soldered-in LEDs (replacement of LEDs not possible).

1. Left turn signal indicator
2. Indicator lamp area
3. Right turn signal indicator

LC Display

The LC display is located between the speedometer and the rev counter. The LC display is divided into two areas. The time and outside temperature are displayed in the upper window, along with the set speed for the ACC, check control messages and CBS displays.

The on-board computer functions, trip distance counter and CBS messages are output to the lower window. A manipulation dot indicates if there are different vehicle identification numbers in the light module and in the instrument cluster.

1. Upper LCD display area
2. Lower LCD display area
3. Trip counter reset button

Program and Gear Display

On vehicles with automatic transmission or sequential manual transmission (SMG), the program and gear selected are shown in the center of the lower window of the LC display.

The program and gear display is activated when terminal 15 is on. At terminal 15 off, run-on operation of the display is possible provided the SMG is still transmitting CAN messages.

The information between the control units for the automatic gearbox or SMG and the instrument cluster are exchanged via the K-CAN. The program and gear display shows letters and numbers. The program mode is displayed all the time and is not overwritten by other information.

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Note: With SMG, the selector-lever position "N" flashes after the engine is turned off. This indication serves as a visual reminder that the car could still roll away.

Principle of Operation

The control unit of the instrument cluster incorporates certain functions over and above the display and indication functions, namely:

- Lighting of the instrument cluster
- Dimming of the instrument cluster
- High and low-voltage detection for the instrument cluster
- Heating and contrast for the LCD display
- On-board computer functions
- Check-Control messages
- Pre-drive check
- Condition Based Service (CBS)
- Vehicle identification check

Lighting of the Instrument Cluster

The instrument cluster has an integral power supply unit. The power supply is connected to terminal 30. The power supply provides the supply voltage for the instrument cluster.

This arrangement means that the lighting of the instrument cluster is independent of the on-board power supply. If the on-board power supply is disrupted (voltage dips), the brightness cannot fluctuate.

LEDs in BMW orange provide backlighting for the LCD display, the pointers of the analog instruments and the scale rings.

The pointers and the scale rings are illuminated when the lights are switched ON (= function display).

The display itself is not back-lit unless it contains a reading.

Acoustic Generator

Acoustic warnings are issued in support of the Check-Control messages. The instrument cluster controls these warnings by means of the K-CAN. The M-ASK and CCC emit acoustic warnings through the loudspeakers.

An additional loudspeaker in the instrument cluster issues the following acoustic warnings:

- Flash
- Hazard warning lights

Dimming of the instrument cluster

The brightness of the LCD display and all indicator and warning lights is adapted to suit ambient lighting conditions. This function is implemented by a phototransistor in the instrument cluster.

The brightness signal is calculated in the instrument cluster on the basis of the following values:

- Signal from the phototransistor (ambient luminosity)
- Dimmer signal (on the control panel for the lights)

The brightness signal calculated in this way is made available to the other control units via the K-CAN.

High and low-voltage detection for the instrument cluster

If the on-board voltage drops below approximately 7.5 volts, no further read or write accesses to the data memory are permitted. The instrument cluster initiates data backup in advance of a pending reset triggered by undervoltage.

Overvoltage in the on-board power supply is also detected.

If the on-board voltage is greater than 16 volts:

- Certain inputs and outputs are disabled in order to protect the hardware.
- Indicator and warning lights are dimmed for the duration of the overvoltage or are deactivated in order to prevent overload.

Heating and contrast for the LCD display

A heater built into the display ensures good legibility even at low ambient temperatures. The heater is switched on if the temperature of the LCD display is below 10 °Celsius. The switch-on signal is transmitted (by the CAS control unit to the instrument cluster via the K-CAN) when the driver's door is opened.

The contrast of the LCD display is automatically set as a function of the temperature of the LCD display and the operating time. A counter registers the standby times and operating times logged by the instrument cluster, so that due allowance can be made for ageing. Contrast voltage is automatically adjusted depending on increasing time in operation (ageing).

On-board Computer Functions

There are two ways in which on-board computer functions can be displayed:

- in the instrument cluster
- in the Central Information Display (extended on-board computer functions)

The on-board computer functions for the instrument cluster are as follows:

- Ambient temperature
- Time
- Date
- Average consumption (resettable)
- Range
- Average speed (resettable)

The on-board computer function required can be displayed: When terminal R is ON by pressing the on-board computer button on the turn-signal/main-beam switch in a specific sequence. The last line is followed by an empty line, before the first line reappears on the screen (rolling list). When terminal R switches ON, the on-board computer function most recently selected by means of the on-board computer button reappears. If the on-board computer button is pressed and held down for longer than 2 seconds, the values of the resettable on-board computer functions are recalculated.

Check-Control Messages

The Check-Control system informs the driver if important functions, information or warnings are no longer available. Check-Control messages are displayed in the form of a symbol on the LCD display (red, yellow, orange). The instrument cluster discharges the functions of priority control for the Check-Control messages. The readings for time and date and ambient temperature are overwritten. If a Check-Control message is present but not displayed, this will be indicated by warning triangle in the LCD display.

Supplementary notes and instructions are available for most Check-Control messages and are displayed in the Central Information Display (CID) (short form can be found in the status bar).

In addition to the visual display, the Check-Control system also alerts the driver with acoustic signals. Depending on the importance of the associated message, a single or double gong with varying volume and tone will sound.

Current Check-Control messages can be called up with the Check-Control button (press and hold for longer than 2 seconds) on the turn-signal/main-beam switch. The Check-Control messages can then be viewed in sequence (press for less than 2 seconds). When the Check-Control button is pressed, this is registered via the K-CAN.

If 8 seconds pass without a button being pressed, either the time and ambient temperature or a current Check-Control message with priority 1 will appear.

Pre-drive Check

The pre-drive check serves as:

- A check of internal functions in the instrument cluster

- Monitoring of the live signals from all control units that may emit Check-Control messages

During the pre-drive check, the most important indicator and warning lights are activated for 4 seconds when terminal 15 is switched ON. Exception: Indicator and warning lights for airbags actuated when terminal R is switched ON.

The following indicator and warning lights are activated in the pre-drive check:

- Seat-belt warning

- Airbag (initially yellow, then red)

- Anti-lock brake system (ABS)

- General brake warning light (initially yellow, then red)

- Emission warning lamp

- Dynamic Stability Control (DSC)

- Active Front Steering

- ACC control by driver or object detected (initially yellow, then red)

Once a pre-drive check completes successfully, all indicator and warning lights are switched off. If a fault occurs during the pre-drive check, the check is interrupted for the system in question. The indicator and warning lights for this system remain on. The Check-Control system issues the appropriate message.

Service Notes

Redundant Data Storage

If the instrument cluster is exchanged, the stored data (e.g. total distance reading) must be retained. This will make it possible to detect any evidence of manipulation.

In order to guard against manipulation, the following data are stored redundantly (second copy) in the CAS control unit:

- Vehicle identification number
- Total distance reading (kilometer reading)
- Data related to the scopes of the Condition Based Service

The data is verified each time terminal 15 is switched on. A manipulation dot is shown in the LCD display in the event of any discrepancy. The manipulation dot appears to the left of the trip distance recorder.

The manipulation dot is displayed in the following cases:

- The vehicle identification number stored in the instrument cluster is different to the one stored in the CAS control unit.
- A vehicle identification number is not stored in one of the two control units (e.g. new component).
- The module in the instrument cluster for storing the total distance reading is faulty (the kilometer reading is shown as 999999).

Installing a new CAS control unit

- Order the new CAS control unit for the specific vehicle in question, quoting key number, VIN, standard equipment.
- Once the new CAS control unit has been encoded (DME/DDE control unit and CAS control unit mutually identified and calibrated), the engine can be started.

Important: Do not install a used CAS control unit.

The engine cannot be started if the CAS control unit being fitted has already been used (different vehicle identification number).

Installing a new instrument cluster

- The manipulation dot is displayed when terminal 15 is activated because the instrument cluster has not yet been encoded with the vehicle identification number.

- Encode the instrument cluster (input the vehicle identification number in the instrument cluster and assign it to the vehicle).

- Switch terminal 15 off and on. After terminal 15 has been switched back on: The current kilometer reading and the CBS data are transmitted to the instrument cluster by the CAS control unit. The manipulation dot disappears.

Test installation of a new instrument cluster

The VINs in the instrument cluster and CAS control unit do not match or the VIN has not yet been entered in the instrument cluster.

A bidirectional communication between the instrument cluster and the CAS control unit takes place as follows:

- The kilometer reading stored in the CAS control unit, for example, is transferred to the working memory of the total distance recorder in the instrument cluster and then displayed. During a test drive, the kilometers covered continue to be metered in the working memory of the total distance recorder and are sent to the CAS control unit every 10 km.

- If at least 24 hours have elapsed between terminal 15 being switched off and on, calibration will be repeatedly automatically regardless of the distance covered.

- When the instrument cluster is removed following a test drive the working memory loses the kilometer reading stored. The instrument cluster is reset to the initial status.

Important: An instrument cluster that has previously been used will not be reset.

The vehicle identification number entered in a used instrument cluster can be overwritten until a distance of 254 km has been covered. It is then impossible to reset the permanently stored value.

Simultaneous replacement of CAS control unit and instrument cluster

Important: Do not replace the CAS control unit and the instrument cluster at the same time.

Avoid simultaneous exchange of the CAS control unit and instrument cluster due to the risk of the current kilometer reading and all CBS data being irrevocably lost.

Follow the steps below if it is necessary to replace both control units at the same time (e.g. neither respond to the BMW diagnosis system):

- Replace the instrument cluster

- Encode the VIN in the instrument cluster

- Switch terminal 15 OFF, then ON. There may actually be a transfer of data between the CAS control unit and the instrument cluster.

- Replace the CAS control unit

- Encode the VIN in the CAS control unit

- Switch terminal 15 off then on again.

- The manipulation dot is cleared after the terminal 15 is switched back on. Communication between the instrument cluster and CAS control unit for redundant data storage is now ensured.

Instrument Cluster Test Functions

The test functions are useful for troubleshooting with the BMW diagnosis system. The test-function readings are displayed in the upper zone of the LCD display. The texts for the test functions are stored in the German-language version only.

With terminal R ON or terminal 15 ON:

Press the reset button in the instrument cluster for 10 seconds to reset the test functions.

The test functions can be scrolled through with the reset button in the instrument cluster.

An alternative means of accessing the test functions is: hold down the reset button in the instrument cluster and simultaneously switch terminal R ON.

Note: Disabling and enabling the test functions

Only the first two test functions are freely accessible. The test functions are disabled from No. 3 onward.

They can be enabled only in test function No. 19.

The test functions are enabled by: entering the sum obtained by adding together the last five digits of the VIN.

Note: For detailed list of Test Functions, access the latest SBT in WebTIS.

Condition Based Service (CBS)

With the series launch of the new 5 Series, BMW will also be offering service intervals that are geared towards the current condition of selected critical components - i.e. servicing that depends on the condition of components and maintenance requirements; this is known as Condition Based Service (CBS). CBS means thus: maintenance only for the component which is worn.

The system calculates when a service operation, e.g. an oil change or emissions inspection, is due and informs the customer of this via the LC display in the instrument cluster.

CBS sorts all the data according to date due and can determine when the vehicle should be taken into BMW Service.

The instrument cluster sends the sorted data to the Central Information Display (CID). There, the data can be selected for display in the Service menu. There are ten different types of service, with each of these types being assigned to a specific service group.

The system involves the following components:

- Instrument cluster
- External units (DME, IHKA, DSC)
- Car Access System (CAS) 2
- Central Information Display (CID)

All information that the CBS system requires is sent on the K-CAN bus. The instrument cluster is a subscriber on the K-CAN and acts as the CBS master control unit. The CBS requests from all the control units are therefore sent via the K-CAN to the instrument cluster and to the Central Information Display.
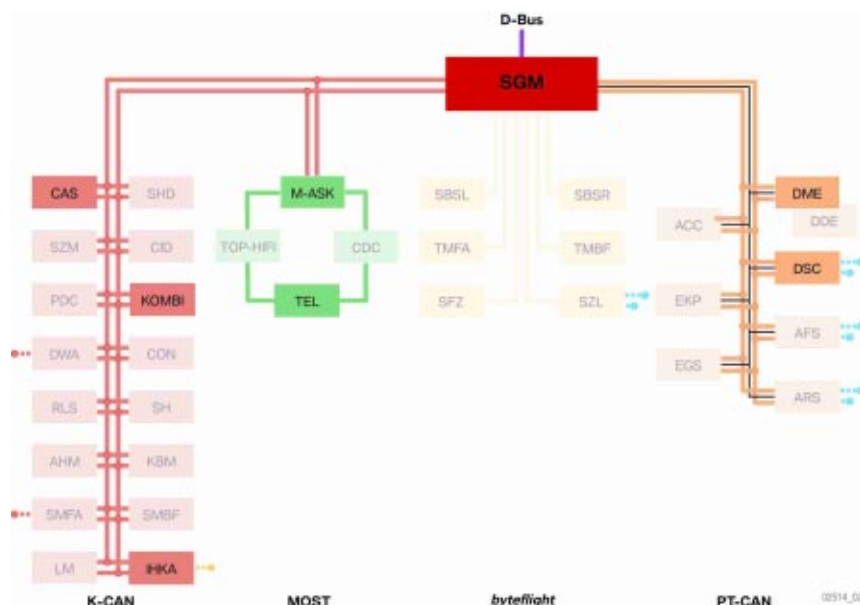
CBS Displays

Displays in the Instrument Cluster
The CBS display always comprises the following two separate displays:

- A colored symbol in the upper display

    -Orange for normal

    -Yellow for service due

    -Red for service overdue

- And information on remaining distance and/or due date in the lower display.
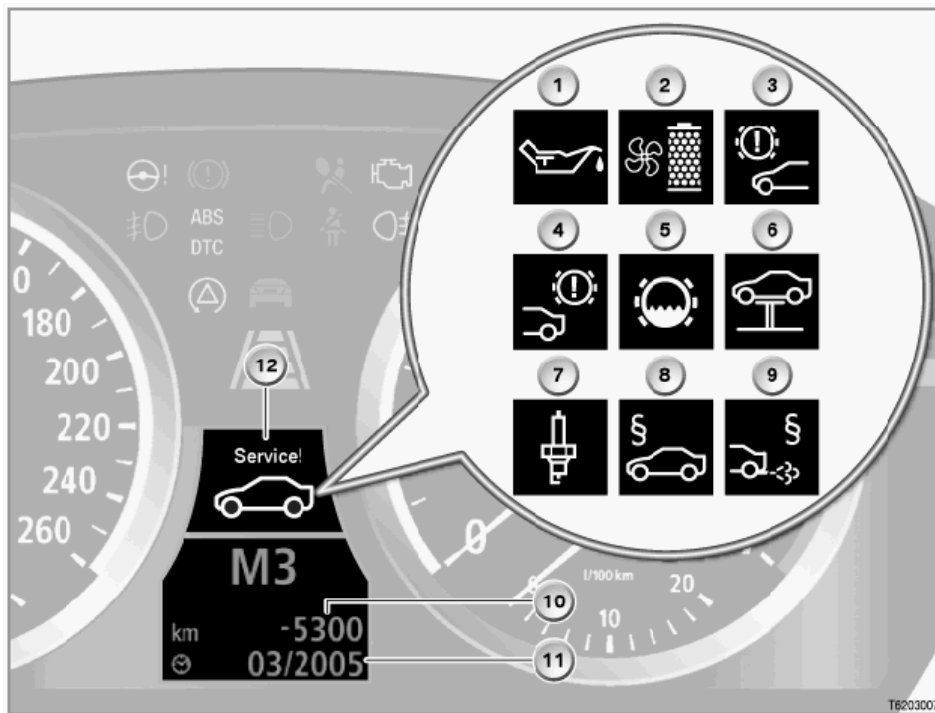
Index	Explanation	Index	Explanation
1	Engine Oil	7	Spark Plugs
2	Microfilter (IHKA)	8	Statutory vehicle inspection
3	Front brake pads	9	Emissions test
4	Rear brake pads	10	Countdown to next service
5	Brake fluid	11	Date for next service
6	Vehicle Check	12	CBS Symbol

Displays in the Central Information Display (CID)

All information on the individual service operations can be displayed in the CID. The CBS functions are stored in the "Settings" menu item which is used exclusively for individual user settings.

Press the Controller, the "Settings" menu will appear.

Turn the controller until "Service" is highlighted, then press to activate the CBS menu.

The CBS menu window will appear; this is divided into the following control and display fields:

- Status bar

- First menu bar

- Second menu bar

- Display field for CBS symbol

- Display field for service operation

Index	Explanation
1	First Menu Bar • Service Requirement, Check Control Messages • Service
2	Second Menu Bar - Status
3	Display Field for CBS Symbols
4	Status Bar
5	Display Field for Service Operation

The service operation display field always shows the first five messages.

The displays are color-coded and some also have a symbol.   The displays mean the following:

- Red - The service operation is overdue

- Yellow - The service operation is due shortly

- Green - No service operation required

Any overdue service operations and symbols marked in red in the list are always at the top of the list of messages.

You can scroll through the list of the service operations from top to bottom by turning the controller (left/right).

To display the information concerning a specific service operation on the CID, turn the controller to select the required service operation and display the selection by pressing the controller.

Note: All screen shots shown are derived from a simulation of a version with featuring a 6.5" medium-resolution color LC display and correspond to the status at the time of going to press. Further changes are possible to the contents and the layout.

Resetting the Service Operations

When one or more operations have been carried out, e.g. front pads have been changed, these operations must be reset to their full service interval.

There are two options for resetting the service operations:

- Legally required service operations - Legally required service operations such as the Statutory vehicle inspection (HU) and the Statutory exhaust test (AU), can only be reset in the "Service" menu.

- Maintenance service operations - All service operations for the purpose of maintenance are reset by means of the reset button of the trip distance counter in the instrument cluster. If the reset button is pressed for longer than ten seconds, the reset mode opens automatically. "Reset?" is displayed in the lower display window.

In the upper display window, the CBS symbol , e.g. for "engine oil service overdue" will be displayed. Press the reset button until the time/distance-dependent displays in the lower display window are replaced with dashes. Reset is no longer possible once more than 80 percent of the interval has expired. A reset lock will be shown in the display with "OK".

1.Reset Button for trip counter

2. Upper display window (CBS)

3. Lower window display

Diagnostics

There are three possible combinations for replacing the instrument clusters and Car Access System.

- Instrument cluster faulty, Car Access System OK

- Car Access System faulty, instrument cluster OK

- Car Access System and instrument cluster must be replaced.

Simultaneous replacement of the Car Access System and the instrument cluster must be avoided. The odometer reading will be lost as a result. In principle it is also possible to carry out a trial replacement of the instrument cluster/Car Access System.

Central Information Display (CID)

The Central Information Display is an integrated display and operating panel for the following functions:

- Audio systems such as radio, CD, MC
- Computer, journey computer
- Check Control messages
- Navigation
- Needs-based service (BOS)
- Vehicle info
- Brief info
- Telephone and data services
- CD-ROM or DVD
- Personalized functions such as station selection
- Heating and air conditioning system
- Vehicle functions such as DSC, EDC, PDC, RDC
- Service mode
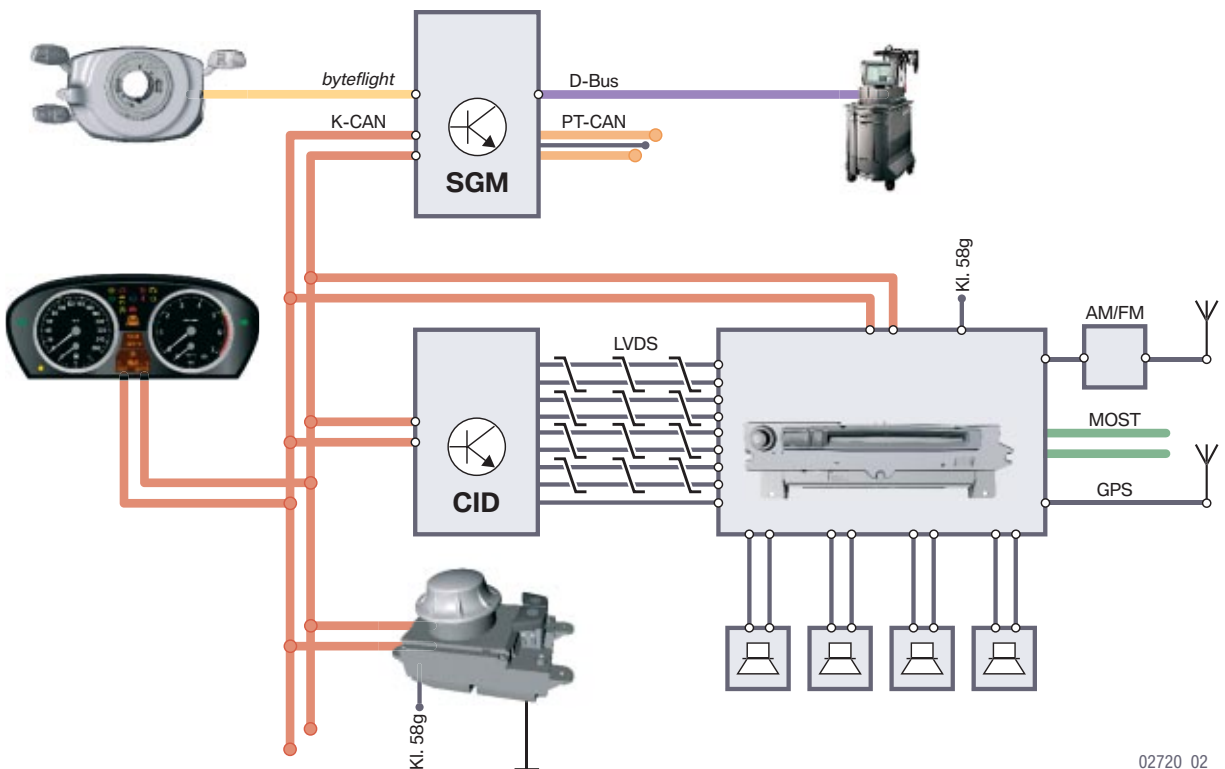
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New Features

The CID of the E60 has new features or modified features:

- Main Menu reduced to four selections
    - Communication
    - Car Data (unless equipped with Navigation)
    - Entertainment
    - Climate Control
- User settings available in an additional menu setting
- Two variants of controller
- New Menu button
- Voice Input button on center console

Bus Network

The M-ASK generates the LVDS data (Low Voltage Differential Signaling) for the graphic display in the Central Information Display.

The central operating control for the Central Information Display is the controller. The controller is connected to the CID via the center console control center (SZM) and the K-CAN system.

The Safety and Gateway Module (SGM) provides the diagnostics interface for the CID via the diagnostics bus.

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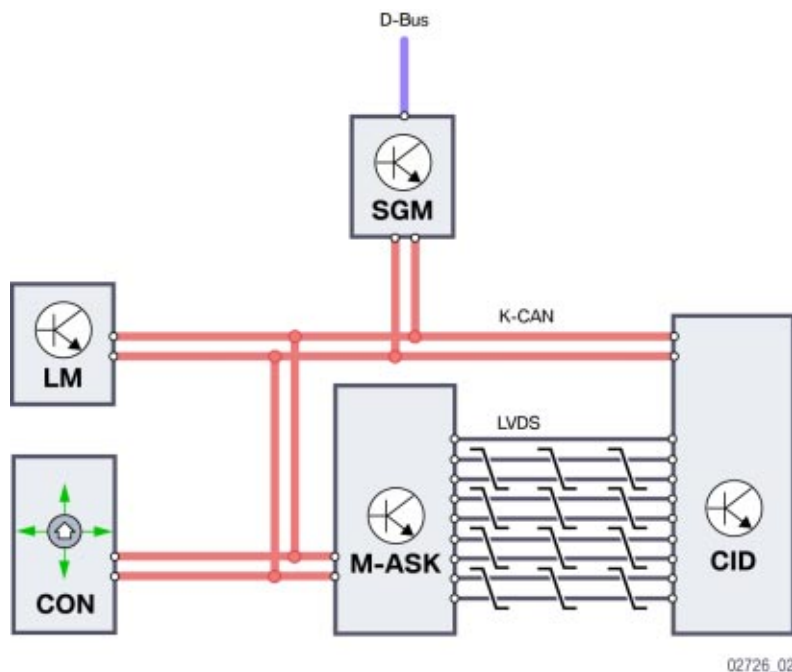
Components

The Central Information Display (CID) is comprised of the following components:

- Casing with integral electronic module
- LC display
- Casing attachment (tube) with cover glass
- Controller, a connected component which controls the displays in the CID.

1. Casing with electronics
2. LC Display
3. Casing with glass

LC Display

In order to cope with the various equipment specifications, the following variants are used for the E60:

- CID with 6.5" medium-resolution color LCD (400 x 240 pixels)
- CID with 8.8" high-resolution color LCD (640 x 240 pixels)

The LCD also features a help window. The casing is designed to be able to accommodate all screen variants offered. The entire Central Information Display assembly is fixed to the dashboard by two screws.

Controller

The controller is the central operating control for all comfort functions and selected options for some vehicle functions that are displayed on the Central Information Display.

The controller is located in the center console immediately behind the gear selector lever, within reach of the user (driver and front passenger).

For the first time, the controller will be available in the following two variants for the E60:

- Variant A - The base variant has a mechanical latch system with 24 latches per full turn.

- Variant B - On the high-end version, the tactile feedback for the rotational movement of the controller is generated electrically. The tactile feedback for the rest position, the main directions of movement and the depressed position is created by mechanical means.

The operating principle of the controller is identical with that of the E65.

The controller is slid from a rest position (center position) to which it always returns again when it is released.

The main features of the operating principle are:

- The center is the rest position (center position)

- Slide to select the four main directions of movement

- Turn to select the function

- Press to select or confirm entry.

There is also a panel of buttons immediately behind the controller. There are two variants, as follows:

- Basic variant - This version comprises a menu button which is used to call up the main menu in the Central Information Display.

- High-end variant - This version has two buttons. In addition to the menu button, there is a button for activating/deactivating the voice input system (SVS). The button signals are read into the controller and converted into K-CAN telegrams.

The four menu items are displayed in a cross pattern on the Central Information Display corresponding to the four main directions in which the controller can be moved.

In addition to these four main menu items, there is a fifth menu item used exclusively for individual user settings. The screen can also be switched on and off from this menu.

Status Bar

The status bar displays the main information on the various functions, such as the telephone signal strength or the time; this information is permanently displayed after Ignition ON.

Index	Explanation	Index	Explanation
1	Automatic A/C Activated	4	Unread Text Message
2	Audio Source Activated	5	Telephone Signal Strength
3	TMC (Not for USA)	6	Time

Communications

In this menu, entries in the telephone directory can be displayed and sorted according to various criteria. Here too, the user can query his SMS (Short Message Service) inbox for incoming text messages or display any calls that were not answered.

This menu also contains the BMW services such as BMW Assist and BMW Online. Certain services are only available to customers once released.

Navigation

This menu provides access to all functions necessary to operate the navigation system. The computer can also be selected from this menu item. Certain services are relevant to specific equipment and are only available to customers after appropriate authorization. The main menu is activated as soon as terminal 15 ON is on.

Entertainment

The Entertainment menu is a frequently used function. Certain services are relevant to specific equipment and are only available to customers once released. The main menu is activated as soon as terminal 15 ON is on.

Climate

As on the E65, the extended conditioning functions such as mixture control and automatic heater can be selected and activated from the Central Information Display. The main menu is activated as soon as terminal 15 ON is on.

Settings

The individual user settings can be adjusted from this menu. The main menu is activated as soon as terminal 15 ON is on.

Service Mode

Service mode is a special facility which provides information about the status of the display and user control system. The function is designed for use by BMW Service and is not intended to be accessible to vehicle owners. Service mode provides access to details of the hardware/software versions for the Central Information Display and the control units in the M-ASK network. As an addition to the comprehensive facilities of the diagnosis system, Service mode acts as a simple means of quickly accessing diagnostic data without the need for a diagnosis tester.

Activating Service Mode

In the main menu, press and hold the controller. Tactile feedback will then be generated.

- Turn controller 3 stops clockwise

- Turn controller 3 stops anti-clockwise

- Turn controller 1 stop clockwise

- Turn controller 1 stop anti-clockwise

- Turn controller 1 stop clockwise

- Press the controller to confirm, Service mode will then appear in the CID.

Workshop Exercise - Driver Information

Access the appropriate SBT in WebTIS for the E60 instrument cluster. Print out the instrument cluster test functions page.

Using an instructor designated vehicle, unlock the test functions.

Describe the procedure for unlocking the test functions:

_____

_____

_____

_____

What is the test test for "fuel tank contents"? Record data below.

_____

_____

_____

How is this test step helpful in diagnosis?

_____

_____

_____

Describe Test step 21 and how it is helpful in diagnosis.

_____

_____

_____

List the steps necessary to set a preset radio station:

_____

_____

_____

_____

_____

What information is found under the heading "Car Data"?

_____

_____

_____

What are the possible "program" options for the "Star" MFL Button?

_____

_____

_____

_____

List the steps necessary to reset the average speed reading:

_____

_____

_____

_____

Using the Controller and CID, set the door locks to "Relock door if not Opened":

_____

_____

What is the current setting of the speed dependent volume?

_____

_____

What is the current setting of the pathway lighting?

_____

Increase the time setting by 2 increment levels. What is the setting?

_____

Access the check control messages. What is the current message?

_____

_____

_____

Classroom Exercise - Review Questions

1. What are some of the differences between the instrument cluster used on the E60/E61 versus the E63/E64?

   _____

   _____

   _____

   _____

2. What temperature would be displayed if the ambient temperature circuit was open?

   _____

   _____

3. What action initiates the heating function of the instrument cluster?

   _____

   _____

   _____

4. What instrument cluster information is stored redundantly in the CAS?

   _____

   _____

   _____

   _____

5. What is the consequence of replacing the instrument cluster and the CAS at the same time?

   _____

   _____

6. List two methods for entering the instrument cluster test functions:

   _____

   _____

   _____

   _____

   _____

7.   In the CBS display in the instrument cluster, What does a red symbol indicate?

_____

_____

_____

_____

8.   What is the diagnostic pathway between the D-bus and the CID?

_____

_____

_____

_____

9.   What criteria dictates the position of the "variable warning zone" in the tachometer?

_____

_____

_____

10.   What are the maximum/minimum voltage requirements for proper instrument cluster operation?

_____

_____

_____

_____